# Performance Anxiety at English PBL Groups Among Taiwanese Medical Students: A Preliminary Study

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Students' performance anxiety can impact negatively on the effectiveness of medical education reform, including performance in problem-based learning (PBL) and in using English in discussion. This study aimed to investigate the nature of performance anxiety among Taiwanese medical students in an English-language PBL group. Eighteen Taiwanese, one American and four Asian medical students who were attending an international PBL workshop were enrolled. A questionnaire seeking demographic data and experience in use of PBL and eight questions evaluating performance anxiety were administered. The performance anxiety of Taiwanese medical students was compared to that of the Asians and the one American. Frequencies of each performance anxiety were calculated. The results suggested that the Taiwanese students showed more anxiety than the one student from the United States, but less than other Asian students. The acts of giving a report, being the center of attention, and talking in the PBL group were the most common situations related to anxiety in PBL groups. Using English and working in a new PBL environment are possible sources of anxiety. The presence of anxiety among the Taiwanese medical students in English PBL groups implies the necessity for developing an effective strategy to deal with students' performance anxiety.

**Key Words:** English language, performance anxiety, problem-based learning
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Medical education is undergoing a minor revolution in Taiwan. Active learning strategies and internationalization have become the areas of most important focus. Problem-based learning (PBL) is a pedagogical strategy of active learning. It was introduced and used extensively at McMaster University, Hamilton, Ontario, Canada. PBL is based on learning driven by challenging and open-ended problems. It features students working in small collaborative groups and, contrary to the common, more passive educator's role, teachers act as facilitators of learning. The advantages of PBL include enhancing contextual knowledge, and developing communication, problem-solving, and self-directed learning skills [1,2].

As in a variety of fields, another trend in medical education in Taiwan is internationalization. To develop a smoother interface and promote efficient communication between Taiwan and developed Western countries, several universities have initiated educational programs using English as the primary language of communication.

Despite the benefit of novel teaching methods using PBL or English, some accompanying barriers

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have not been studied sufficiently. These barriers may compromise the acceptance and progress of these contemporary teaching methods [3]. Students' performance anxiety is possibly one of the barriers [4], but understanding the nature of this anxiety may help the tutor to manage its profile and outcome and improve the effectiveness of learning.

A previous study describing a higher prevalence of emotional disturbance among medical students compared with the general population and age-matched peers has been reported [5]. Medical students experienced a variety of stressors related to learning [4,6,7]. High levels of anxiety and stress during medical education may negatively affect students' learning and performance [8]. Performance anxiety may emerge when medical students join the new teaching program using a non-native language, like English. Understanding the nature of performance anxiety among Taiwanese medical students in a novel teaching program can help the development of effective interventions to reduce their distress.

An opportunity to study this phenomenon was presented by an international PBL workshop held by Kaohsiung Medical University, Taiwan in July 2007. Altogether, 59 students from medical schools in Taiwan, Japan, South Korea, Hong Kong, Poland and the United States took part in the PBL workshop. English was the language used by all students and tutors in the workshop. Given this opportunity, we conducted a performance anxiety survey of students coming from a variety of country backgrounds, with a primary focus on Taiwanese medical students. The aims of this study were to: (1) describe the characteristics of performance anxiety of Taiwanese students; (2) compare the performance anxiety of Taiwanese medical students with that of students from other countries; and (3) examine the correlations between performance anxiety and both demographic features and past experiences of attending education among the medical students.

## Methods

All study participants were medical students who attended an international PBL workshop held by Kaohsiung Medical University in July 2007. A few days after the end of this workshop, a study questionnaire was sent to all 59 student participants via email. Twenty-three students responded to the questionnaire.

The questionnaire was composed of: (1) an explanation of the purpose of this study, and a request for the responders' consent; (2) demographic background, including nationality and experience of PBL; and (3) a performance anxiety scale. We adopted eight items of the Liebowitz Social Anxiety Scale (LSAS), which were selected and modified to be suitable for the PBL situation to evaluate performance anxiety [9]. The original LSAS is composed of 24 items and was developed to assess social anxiety. Factor analysis of LSAS yielded four factors: social interaction, public speaking, observation by others, and eating and drinking in public [10]. Eight items were selected and modified as shown in Table 1.

The eight items involved the four factors of LSAS, except eating and drinking in public. The Likert scale of 4 points, representing no anxiety (0), mild anxiety (1), moderate anxiety (2), and severe anxiety (3),

**Table 1.** Performance anxiety in a PBL group among Taiwanese medical students

| | *n* (%) | Mean (SD) |
|---|---|---|
| I felt anxious when participating in the PBL group | 12 (66.7) | 0.8 (0.6) |
| I felt anxious when talking in the PBL group | 13 (72.2) | 1.0 (0.8) |
| I felt anxious when giving a report in the PBL group | 15 (83.3) | 1.2 (0.8) |
| I felt anxious when talking to the tutor | 10 (55.6) | 0.6 (0.6) |
| I felt anxious when talking with people I don't know very well in the PBL group | 10 (55.6) | 0.7 (0.8) |
| I felt anxious when talking with people from countries other than mine in the PBL group | 9 (50.0) | 0.6 (0.7) |
| I felt anxious when being the center of attention in the PBL group | 14 (77.8) | 1.1 (0.9) |
| I felt anxious when expressing disagreement or disapproval in the PBL group | 12 (66.7) | 1.1 (0.9) |

was used. The sum of the scores on these eight items represented the severity of performance anxiety for an individual student. In addition, to examine the distribution of each item across different groups, we dichotomized the response of each item. "None" was a non-significant response while "mild", "moderate" and "severe" were significant responses.

Study participants were informed of the purpose of this survey and consented to fill out a questionnaire. Nonparametric statistical analyses were used, as the number of participants was limited. A Kruskal-Wallis test was adopted to compare the differences in total scores of performance anxiety across different categories. Correlations between two continuous variables were calculated using Spearman tests.

## Results

All 23 valid responses were received within 2 weeks after the end of the PBL workshop. The backgrounds of those responding are shown in Table 2. The majority of respondents were medical students in Taiwan; the others included one student from the United States, one from South Korea, and three from Hong Kong. We regrouped the four Asian students, other than the Taiwanese, into one group, as English is not their first language. Then, we compared the backgrounds of the three groups: Taiwanese, Asian, and American. Periods of experience of a PBL curriculum were similar, about 1–2 years, across the three groups.

The sums of the scores on the eight items used to assess performance anxiety were compared across the three groups. The mean was 7.0 (SD = 4.0) in Taiwanese students, while in other Asian students it was 9.8 (SD = 2.1). The American student scored 2 on this scale. The American student seemed to be the least anxious in the PBL group, followed by Taiwanese students. The four Asian students presented the most prominent anxiety. However, a nonparametric Kruskal-Wallis test ($\chi^2 = 3.2$, df = 2; $p = 0.20$) showed no difference across the three groups, which may be due to the low statistical power resulting from the very small study sample size. For the Taiwanese students, anxiety severity did not correlate with age (rho = –0.34; $p < 0.17$) or with how long they had been in PBL curricula (rho = 0.21; $p < 0.4$).

To examine the types of performance anxiety in Taiwanese students, we rated the frequencies of respondents describing mild, moderate or severe anxiety on each item of the anxiety scale. Table 1 shows the most common performance anxiety in the Taiwanese medical students occurred when giving a report (83.3%), followed by being the center of attention (77.8%), and talking in the PBL group (72.2%). However, for the severity of anxiety, our students presented only mild to moderate anxiety in PBL (mean of severity 1.0–1.2).

## Discussion

This preliminary study demonstrated performance anxiety occurs when Taiwanese students take part in a PBL group using English. Although the small sample size limits statistical power in examining the difference across different nationalities, the results showed that the Taiwanese students participating had more anxiety than the one student from the United States, but less than other Asian students. The activities related to the most prominent anxiety in PBL groups were giving a report, being the center of attention, and talking in the PBL groups.

In our study, we observed a high prevalence of anxiety, although the severity is mild to moderate, especially in students coming from non-English-speaking countries. Possible sources of their anxiety include speaking English during PBL tutorials, and

**Table 2.** Characteristics of students attending an international PBL workshop*

| | Taiwan ($n = 18$) | Other Asians† ($n = 4$) | United States ($n = 1$) |
|---|---|---|---|
| Age (yr) | 22.5 (2.0) | 21.3 (3.3) | 25.0 |
| Sex (M/F) | 9/9 | 2/2 | 1/0 |
| Prior experience of PBL course (year) | 1.6 (0.7) | 2.0 (0.8) | 1 |
| 8-item LSAS | 7.0 (4.0) | 9.8 (2.1) | 2 |

*Data presented as mean (standard deviation) or $n/n$; †including 1 South Korean and 3 Hong Kong students. LSAS = Liebowitz Social Anxiety Scale.

participating in a very active style of PBL. The secondary finding in our study is that Taiwanese medical students seem to appear less anxious compared with students coming from South Korea or Hong Kong, although the small sample size does not allow a confirmatory comparison. The comparison is interesting and warrants further study with a larger sample size.

It is possible English speaking is the most challenging area in terms of presentation and discussion for these students. This may also explain why the one American student displayed the least anxiety in this group. These difficulties for non-native English speakers can lead to anxiety, which in turn compromises the effectiveness of the PBL program. Another source of anxiety may be the new type of learning. We tried to analyze the correlation between performance anxiety and the duration of time during which students had had previous experience of PBL. The correlation was not significant. Some may argue the period of PBL experience is not valid enough to represent familiarity with PBL curricula. Since our previous study demonstrated medical students might have anxiety related to a new curriculum [11], the new PBL curriculum is still possibly one of the sources of anxiety.

PBL, besides contextual learning, is a focus of recent medical education reform in Taiwan. A PBL curriculum has been adopted to facilitate active and small-group cooperative learning. Some researchers doubted the effectiveness of PBL in improving knowledge and clinical performance [12]. Barriers associated with the effectiveness of PBL may include the students' personal adaptive mechanisms. Medical students are usually groomed and selected for superior academic performance in a traditional curriculum. They may not necessarily be accustomed to new curricula, and may not be any less traditional and dependent in their thinking than "regular" students [3]. Our previous work also found that medical students from the undergraduate-entry program displayed poorer psychological wellbeing than those from the graduate-entry program throughout a new medical education curriculum [11]. The undergraduate-entry medical students achieved the highest standard of traditional curriculum, but they demonstrated worse psychological coping mechanisms when enrolled in a medical education reform program.

Our findings show the highest rate of performance anxiety occurs when giving a report, being the center of attention, and talking in groups. These activities involve public speaking, observation by others and social interaction respectively, which are three of the four factors derived from the construct of LSAS. This indicates that performance anxiety is one kind of social anxiety for medical students. Despite none having severe anxiety enough to receive a diagnosis, some medical students may have social anxiety disorder. Social anxiety disorder is not uncommon [13,14]. One screening study of social anxiety disorder among the 1st year university students displayed 7–30% of students presented significant social anxiety [15]. Further evaluation of performance anxiety among students with social anxiety disorder in a PBL curriculum is suggested. Dealing with the students' anxiety in a PBL group is also important. To achieve better effectiveness of PBL in knowledge acquirement and clinical skill, screening and management of students with social anxiety is suggested. For those students with anxiety, relaxation training before curriculum presentation, development of a support group and more practice after curriculum conclusion may ameliorate the negative influence of anxiety on PBL.

Some caveats of this study need to be mentioned in this report. First, this study was conducted after an international PBL workshop that attracted motivated volunteer students. Therefore, it is hard to fully extrapolate our results to the general medical student population. However, our findings can be considered as a pilot study for further study in this population, or even for all university students. Secondly, our study sample is small. We can see the result that Taiwanese medical students showed less anxiety than those coming from other Asian countries. However, the small sample size limited statistical power, and this can lead to type II error. With a larger sample size, we could make a better conclusion about this issue.

In conclusion, performance anxiety can be generated in a PBL group using English as a non-native language as the communicative medium. To counteract the negative effect of anxiety on learning, strategies to manage performance anxiety should be developed.

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